In re: Takeishi et al.
Serial No.: 10/730,638
Filed: December 8, 2003

REMARKS

Claims 1–6 and 8 are pending in the present application. The claims stand rejected for allegedly being anticipated and/or being obvious over the prior art. Applicants respectfully request entry of the amendment above and further consideration of the application in view of the present amendment and the comments below.

Support of Amendments

The amendments presented above have been made to recite particular embodiments of the inventions so as to expedite the prosecution of the present application to allowance in accordance with the USPTO Patent Business Goals (65 Fed. Reg. 54603, September 8, 2000). These amendments do not represent an acquiescence or agreement with any of the outstanding rejections.

Claims 1 and 3 are amended herein to more particularly point out what Applicants regard as the invention. Support for these amendments can be found in the specification and in the claims as originally filed. The points raised by the Examiner in the Action are addressed hereinbelow in the order in which they are presented in the Action.

Claims rejections -35 U.S.C. § 102, Niu et al.

Claim 1 stands rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0180215 A1 to Niu et al. ("Niu et al."). The Examiner presents that Niu disclose a supported catalyst comprising a plurality of particles, each said particle comprising a catalytic component and a porous refractory support, suitable catalytic components including Cu, Fe and Zn, and the catalyst having an average pore diameter of about 10–100 nm (100–1,000 Å). The Examiner alleges that the instant claim is anticipated by the teachings of Niu et al. in that the instantly claimed pore diameter falls within the range of pore diameters disclosed in Niu et al.

Case law holds and the Manual for Patent Examination Procedure ("M.P.E.P.") states that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal*

Brothers v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Additionally, anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention. *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). Furthermore, a finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. *See Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

Furthermore, when the prior art discloses a range, which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." See M.P.E.P. § 2131.03.

Applicants amend claims 1 and 3 herein, adding the recitation "wherein the catalyst is prepared by a sol-gel method." The catalyst of Niu et al. has an average pore diameter of 100–1,000 Å, a specific surface area of 4–10 m^2/g, a pore volume of 0.01–0.1 cc/g (see claim 47), and is prepared by an impregnation method and a co-precipitation method. The catalyst instantly claimed has a higher specific surface area and total pore volume than the catalyst of Niu et al. as indicated in the table below.

#	Sample	Specific surface area [m^2/g]	total pore volume [cc/g]	average pore diameter [Å]
1	Cu(30%)/Al_2O_3 sol-gel	204.2	0.4184	81.97
2	Cu-Mn(29.8–0.2)/Al_2O_3 sol-gel	214.6	0.4891	91.18
3	Cu-Mn(29.5–0.5)/Al_2O_3 sol-gel	228.2	0.4865	85.28
4	Cu-Mn(29–1)/Al_2O_3 sol-gel	211.2	0.5325	100.9
5	Cu-Mn(28.5–1.5)/Al_2O_3 sol-gel	191.8	0.3553	74.08
6	Cu-Mn(27–3)/Al_2O_3 sol-gel	206.6	0.4248	82.26
7	Cu-Mn(25-25wt%)/Al_2O_3 impregnation	47.33	0.1566	132.3

#1–6: present invention, #7: data for comparison.

The present invention is directed toward a catalyst having an average pore diameter of 80 Å to 200 Å. However, the catalyst of the present invention, as prepared by a sol-gel method, has pores that are deep and of relatively small diameter, whereas the catalyst of Niu et al. pores that are shallow and of relatively large diameter. Thus, one of skill in the art would have known that the catalyst as prepared by the sol-gel method is physically different than a catalyst prepared by an impregnation method and a co-precipitation method as disclosed by Niu et al. In view of the foregoing, Applicants present that Niu et al. do not anticipate the instantly amended claims, in that the claimed catalyst is clearly different than the catalyst as disclosed in Niu et al. In view of the foregoing, Applicants respectfully request that the instant rejection be withdrawn.

Claim Rejections-35 U.S.C. § 103, Niu et al.

Claims 2, 3, 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Niu et al. The Examiner indicates that Niu et al. disclose a supported catalyst, except for the claimed metal concentrations. However, the Examiner presents that it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have predetermined optimum amounts of such metal concentrations in order to achieve an effective catalyst.

To establish a *prima facie* case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claim, and there must be some suggestion or motivation, either in the references themselves or in the

knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. See M.P.E.P. § 2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. § 2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). Lastly, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not in Applicant's disclosure. *In re Vaeck*, 947 F.2d 468, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

As detailed hereinabove in regard to the anticipation rejection, Applicants present that a *prima facie* case for obviousness has not be established, in that Niu et al. do not disclose all the limitations of the catalyst as instantly claimed, as the instantly claimed catalyst prepared by a sol-gel method is not the same as that which is disclosed in Niu et al. Furthermore, the Examiner has indicated that Niu et al. are silent in regard to the claimed metal concentrations. In view of the foregoing Applicants present that the instant claims are unobvious, to which Applicants respectfully request that the instant rejection be withdrawn.

Claim Rejections-35 U.S.C. § 103, Niu et al. in view of Shikada et al.

Claim 4 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Niu et al., as applied to claim 1, and further in view of U.S. Patent No. 6,361,757 B1 to Shikada et al. ("Shikada et al."). The Examiner alleges that Niu et al. discloses the supported catalyst as claimed, except for manganese and its concentration. The Examiner presents that it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have incorporated manganese in the catalyst of Niu et al. at the concentrations suggested by Shikada et al.

As argued hereinabove, Applicants present again that a *prima facie* case for obviousness has not been established, in that Niu et al. do not disclose all the limitations of the catalyst as instantly claimed, as the instantly claimed catalyst prepared by a sol-gel method is not the same as that which is disclosed in Niu et al. and, as indicated by the

Examiner, that Niu et al. are silent in regard to the presence of manganese at the claimed concentrations. In view of the foregoing Applicants present that the instant claims are unobvious, to which Applicants respectfully request that the instant rejection be withdrawn.

Claim Rejections-35 U.S.C. § 103, Cai et al.

Claim 8 stands rejected under 35 U.S.C § 103(a) as being unpatentable over U.S. Patent No. 6,627,572 B1 to Cai et al. ("Cai et al."). The Examiner presents that Cai et al. discloses a process for preparing a catalyst by precipitating the copper and zinc components separately from the aluminum component in aqueous solution to produce a catalyst precursor mixture. The Examiner further indicates Cai et al. discloses that acids can be used in the process, and after precipitation, the resulting precipitate can be dried, calcined and formed into appropriate shapes.

Although Cai et al. does not disclose a "reducing step," the Examiner maintains that it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have incorporated a reducing step into the process of Cai et al., in that it is known and conventional to convert metal oxide catalyst materials into metallic form catalyst materials by reducing. Applicants respectfully traverse this rejection.

Applicants reiterate that Cai et al. disclose a process of preparing a catalyst precursor by precipitating the copper and zinc component separately from the aluminum component. (*See* Cai et al., Col. 5, lines 11–13). In the reference, the process of precipitation includes steps of 1) blending copper soluble salts and zinc soluble salts in an aqueous solution, 2) adding a precipitating agent such as carbonate, bicarbonate or a combination thereof, and 3) adjusting the pH to about 6 to about 9 and a temperature to about 80 °C (*See* Cai et al., Col. 5, lines 14–26). In contrast to the precipitation process taught by Cai et al., the present application teaches the preparation of a catalyst including the step of forming a sol. Cai et al. are silent in this regard. Support for this recitation is outlined as set forth Applicants' previous response mailed March 20, 2006. Applicants

thus respectfully reiterate that the step of forming a sol taught by the present invention is completely different from the precipitation process disclosed by Cai et al, which is evidenced by the completely different pH range of the reaction and the use of precipitation agent by the reference. Cai et al. therefore do not teach or suggest the step of producing a sol recited in the method of claim 8. Secondly, Cai et al. do not teach or suggest aluminum alkoxide, which is a component in the process of forming a sol. Instead, Cai et al. disclose a process of preparing an aluminum component by neutralizing a sodium aluminum or potassium aluminum solution with an acidic material until a pH of about 6 to about 9 is achieved or alternatively by blending an acidic aluminum salt with a basic material. There is no evidence in the reference to teach or suggest that aluminum alkoxide is present in the process described by Cai et al.

The Examiner sets forth in the Action that the arguments reiterated hereinabove were considered but were found to be unpersuasive. However, it is unclear to Applicants from the Action where these arguments have been considered or addressed. Thus, Applicants reiterate that Cai et al. do not teach or suggest all recitations of the method as instantly claimed, and there is no evidence that one of ordinary skill in the art will be motivated to modify the process disclosed by Cai et al. to achieve the claimed method.

Furthermore, as pointed out hereinabove, Applicants reiterate, in the establishment of a case for *prima facie* obviousness, that case law and the M.P.E.P. hold that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. By the admission of the Examiner, Cai et al. do not teach a reducing step. Applicants present that Cai et al. do not suggest the desirability to combine a reducing step with the instantly claimed process.

Applicants thus assert that Cai et al. neither teach all the limitations of the claimed invention, nor provide motivation to combine or modify the reference teachings. In view of the foregoing, Applicants present that the instant claim is unobvious, to which Applicants respectfully request that the instant rejection be withdrawn.

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CONCLUSION

Applicants believe that the points and concerns raised by the Examiner in the Action have been addressed in full, it is respectfully submitted that this application is in condition for allowance. Should the Examiner have any remaining concerns, it is respectfully requested that the Examiner contact the undersigned Attorney at (919) 854-1400 to expedite the prosecution of this application to allowance.

Respectfully submitted,

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Tracy Wallace